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User's Manual for the Commercial Salmon Catch Spreadsheet Program

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ABSTRACT

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Summary information from the commercial salmon catch sales slip data are stored for the years 1952 to the present on the VAX computer at the Pacific Biological Station in Nanaimo, B.C. The summary data contains information on the salmon catch by year, area, time period, gear type, and species. Additional information on fishing effort is also included. A spreadsheet program has been written to allow users to generate a wide variety of report tables for their own use both on the VAX or on a personal computer. This manual describes how to use the spreadsheet program to obtain the information needed.

Keywords: commercial salmon catch, fishing effort, sales slip, salmon database, salmonid, spreadsheet program

RÉSUMÉ

Holmes, M. A. and D. W. A. Whitfield. 1991. User's Manual for the Commercial Salmon Catch Spreadsheet Program. Can. Tech. Rep. Fish. Aquat. Sci. 1807: 44 p.

Des renseignements sommaires fondés sur les données provenant des bordereaux de vente des prises de saumon commerciales sont stockés pour la période allant de 1952 à aujourd'hui dans l'ordinateur VAX de la Station biologique du Pacifique, à Nanaimo, en Colombie-Britannique. Ces données sommaires répartissent les captures de saumon par année, secteur géographique, période de l'année, genre d'engin de pêche et espèce. On y trouve aussi d'autres informations sur l'effort de pêche. Un logiciel tableur a été conçu pour permettre aux utilisateurs de produire un large éventail de tableaux qu'ils peuvent utiliser sur le système VAX ou sur un ordinateur personnel. Le guide indique comment utiliser le tableur pour obtenir les renseignements souhaités.

Mots clés: prises de saumon commerciales, effort de pêche, borderau de vente, base de données sur le saumon, salmonidés et tableur.

FORWARD

This document introduces the new user to the salmon catch data spreadsheet program developed by Doug Whitfield and Tony Chumak for the Dept. of Fisheries and Oceans at the Pacific Biological Station under the Scientific Authority of L. Lapi. The commercial salmon catch data system described by Fred Wong (Wong 1983) contains detailed information on the history of the catch data and the intricacies of its structure. The current report repeats some material because of procedural updates and in the interest of background continuity.

INTRODUCTION

The system described here accesses the catch database (Wong 1983) and produces flexible reports in a generalized spreadsheet form. Output includes a choice of screen display, a printable report, a standard spreadsheet file and a file formatted for input to the PBS Custom Graphics Package (Kuhn, Whitfield and Chumak, 1988). Since most users will use the program through the Salmon Stock Assessment (SSA) menu on the computer at the Pacific Biological Station (PBS),procedures for using the program will be focused on this computer (VAX). When procedure differs between the VAX and micro-computer versions of the program, these differences will be noted in Appendix C. Section I covers background details on the history of sales slip data and the compilation of the PBS catch database. Section II explains the structure of the data in the database, while Section III describes the program with various menus used to format a report.

SECTION I

GENERAL OVERVIEW

Historical Perspective

As the B.C. fishing industry developed, so did fisheries regulations and management problems. It was recognized in the late 1940's that a more accurate and detailed accounting of fishing catch statistics was needed. Consequently, after consultation between government officials, industry representatives and biologists, a report was issued on a multiple sales slip system (Burton 1948). This system was acknowledged to be the best method of providing complete and detailed information on the catch. A trial sales slip system was instigated for the Nass and Skeena River areas and its success led to the extension of this system, in 1951, to the remainder of the province.

In 1967, the Block Brothers Computing Centre in Vancouver (BB) began computer processing and storing the catch data for DFO. Two reports were published annually, but much of the data was still unavailable for users who could not access the data in a timely, flexible or inexpensive manner.

In 1981, PBS purchased its first multi-user computer and the present salmon catch database was designed using the BB catch tapes. Fred Wong developed the programs and subroutines necessary for the efficient storage and retrieval of summary sales slip information (Wong 1983). Catch information on tapes was sent from the Catch Statistics Division of Fisheries Branch to the Salmon Information unit of the Biological Science Branch, where the information was assembled and stored on the PBS computer.

The original reports that users could access on the VAX have now been replaced by the spreadsheet program which allows greater variety in the content of the reports.

Sales slips

The data collection mechanism is via the sales slip. Each time a commercial catch is sold, a sales slips is completed and a copy sent to Department of Fisheries and Oceans (DFO). Information on the sales slip, which becomes the basis of the salmon catch database, is : sales slip number, gear used to catch the fish, date of sale (or landing), company purchasing the fish, number of days fished and statistical area of catch, species, form (round, dressed head on, etc.), number of fish (pieces), weight and price. The sales slips are issued when the catch is first sold, usually at the point of landing. The fish processing companies collate the data and then forward the slips to DFO for keypunching. Some companies now enter the data themselves through an electronic system. The companies manually check the slips then enter them at their work site. Extensive electronic checks are made at the time of keypunching. The Remote Saleslip Entry System (RSE) gathers sales slip data directly via phone lines. DFO will add the electronic data to their sale slip and average weight files. Errors identified by DFO's audit must be corrected by the fish company within three working days. Errors are minimized by validating such things as the vessel CFV, species coding, weight ranges etc. The data are required to reach DFO within seven days of landing the catch.

Keypunching of the sales slips is done by contract staff who sort the information by gear, area and time period and manually inspect and correct obvious errors such as incorrect species codes, month-day transpositions etc. The biological sample data (length, weight, age etc.) are used to estimate the average weight for each salmon species. For a sales slip lacking information on the numbers of fish, but with weight information, the number is estimated by dividing the weight with the average weight of the particular species, area, week and gear concerned.

SECTION II

DATABASE STRUCTURE

Catch Data System

Records of each sales slip reported in a year are stored on magnetic tape by the Statistics Unit of Fisheries Branch in Vancouver. These data are then processed by a series of database programs at PBS. The data may be accessed via the menu-driven spreadsheet report writer, or by user written FORTRAN programs. Library routines exist to handle data access for the user written programs. Summary catch information by year, area, time period, gear and species, number of days open and amount of effort are maintained on the PBS computer. The summary catch database and spreadsheet report writer may also be used on an IBM compatible micro-computer. Annual catch data are usually finalized by October of the year following the reported catch.

Structure of the Catch Data

In order to understand the catch data, it is necessary to know something about the salmon fishery. Salmon are caught near the coast by commercial fishermen. The fishery can be broken into sub-units which expedites management of the many separate salmon stocks. An individual fishery encompasses both a restricted geographic area and time period. Thus, to describe the catch requires the definition of this spatial-temporal unit which we refer to as the catch stratum. This stratum represents the highest resolution of spatial-temporal information obtainable from the spreadsheet program.

The catch stratum has four components, the year, the time period, the fishing area and the fishing gear. While the year and fishing gear have conventional definitions, the time period and area use specialized terms. The basic unit used to delineate the time period is the statistical fishing week (or stat week) which is explained by example in Appendix A. The unit used to delineate a basic geographic area is the statistical fishing area (stat area). These areas are described and shown in Appendix B as part of the catch region list. The use of the word

"statistical" in these terms comes from their association with the catch statistics group within DFO.

The sales slip data are summarized by catch stratum (i.e. year, statarea, statweek and gear) in the database used by the spreadsheet program. Information about individual vessels or individual landings is available on the detailed annual sales slip magnet tapes but the data are totalled for an individual catch stratum in the database. Information about larger units is generated by combining the catch strata into groupings representing wider boundaries of space, time, gear, etc. Some of these groupings can be done automatically by selection of the appropriate spreadsheet menu item. For example, groupings into catch region (catch regions usually incorporate several stat areas) is a potential menu choice. Thus, the program generates all information about units larger than a single stratum by summing over the appropriate strata and related information.

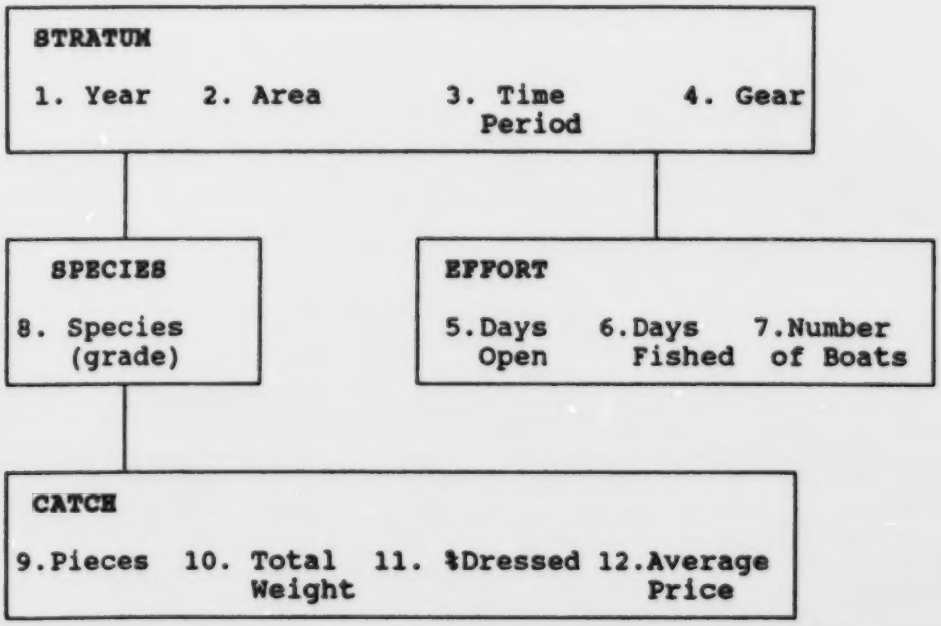

FIGURE 1. Logical Structure of Catch System

The logical relationships of the data fields in the database are graphically shown in Fig. 1. In the figure, the 12 separate data fields have been combined into four groups of related information. For example, the top box in the figure contains the four data fields that together define the catch stratum. Fields which are numbered and listed within a box are independent of one another. Thus, the year and area fields both help define the catch stratum and are independent of each other.

A catch stratum is defined by choosing a single value for year, area, period and gear i.e. 1984, statarea 1, statweek 061, and seine net. If more than one value is chosen for any of these four fields, for example, the statareas 1 & 2, then there is no longer a single catch stratum, but, in this example, two catch strata which could be summed together or reported individually depending on the report choices.

The two boxes on the second level rely on the additional information above them to be interpreted properly. This hierarchial relationship is depicted graphically by the vertical lines connecting the boxes. For example, the second level in the figure includes the effort box, therefore, the effort fields contain information appropriate for the selected catch stratum. Finally, the lowest level contains the catch fields. These fields report information that applies to the combined catch stratum and species selections, but does not need the effort data to be interpreted properly.

Stratum fields: (These fields delineate when and where the fishery occurred.)

Year - The year the landings were made. The catch spreadsheet program starts with 1952 and includes data up to the most current year of available information.

Period - The time period is a subset of the total group of statistical weeks, plus one additional period which includes several statweeks (Appendix A). Statweeks are written as a three digit number, with the first two digits delineating the month and the third digit giving the week within the month. Statweeks 031 through 114 are all included individually within the catch database. The additional period, statweek 120, is defined as all statweeks not included individually above, i.e., statweeks 011 through 024 plus 121 through 124. Prior to 1969, the months of March and April were reported by statistical month.

Area - Data are stored by statarea (see Appendix B). Note that other area types, such as catch region, are available. Catch regions are defined as a combination of statarea and gear type. For some years some statistical areas were divided into subareas and data is reported by subarea when available. Care should be used when using subareas since they will not necessarily total to statarea.

Gear - Four different gear types are specified: troll, freezer troll, gill net and seine net. Day troll boats and ice troll boats are combined in the troll category, while freezer troll is segregated into a category by itself.

Effort fields: (These fields describe the fishing effort associated with a catch stratum).

Days Open - The number of days the fishery was open for fishing. This information is not currently available at this time, however, space for the data has been reserved.

Days Fished - This field and the next report information related to fishing effort. The interpretation of this field is conditional on the gear type. Specifically, for troll boats, the field reports the total number of boat days fished by strata. For net gears, the field represents the total number of landings by strata. These data are only available from 1963.

Number of Boats - This field represents the number of boats making at least one landing within a statarea, statweek and gear stratum. Thus, it has two possible interpretations, one of which is meaningful only for a single catch stratum. These interpretations are:
1). For troll, as a measure of fishing effort, the number estimates boat trips. This definition is still valid when several strata are combined.
2). This field estimates the number of boats participating in the fishery represented by the stratum. This definition may not be valid when several strata are combined, because double counting of boats can occur. There is no number of boats data from 1952 - 1967 in the database.

Species field: (This field selects the species within the catch stratum).

Species - The six species of Pacific salmon, chinook, coho, chum, pink, steelhead and sockeye are all included. In addition, chinook grade types are included as though they also represented separate species. These grade types are: large red (>12 lbs.), medium red (8-12 lbs.), small red (1-7 lbs.), #2 red (<7 lbs.), whites, and jacks (<5 lbs.). Selecting large red results in a summary of all red chinook over 12 pounds. The choice of chinook gives the totals for all chinook grades. Note that the grade types apply only to chinook.

Catch fields: (These fields describe the catch within the selected catch stratum and species composition).

Pieces - The number of fish landed.

Total Weight - The total weight of landed fish. Total weight can be reported in either pounds or kilograms at the user's discretion. This field is conditional on gear type, since the different gear types use different weight standards. Troll fish weight is reported for fish dressed with head on, whereas, for net caught fish, the standard assumed is for round weight (head on, undressed).

% Dressed - The percentage of landings landed as dressed weight rather than round weight. The program compensates for troll landed head off with an algorithm than adjusts to dressed head on. This data is available in 1973 and from 1982 on.

Avg Price - The average price paid for the fish. Price can be reported in either price per pound or per kilogram, at the user's discretion. This data is available from 1972 on.

SECTION III

PROGRAM USER'S MANUAL

A spreadsheet is produced by working interactively with the program and making choices from menus. An interpreter accesses the catch database and then generates the output either interactively or in a batch process. In one session several spreadsheets may be specified, and these specifications may be saved to and restored from disk.

System Access

CDSS can be run either on the VAX at PBS or on a micro-computer with sufficient disk space and memory. While many micro-computers are self-sufficient, DFO uses them to also emulate a terminal on the VAX, where software enables the user to logon directly into the mini-computers while still being on the micro-computer. Details on how to log onto the VAX can be obtained from the Computing Division at PBS.

To begin the interactive spreadsheet program on the VAX enter **SSA C** for Salmon Stock Assessment (SSA menu) - Salmon Catch Database being selected (C):

```
DAFfy>SSA C
```

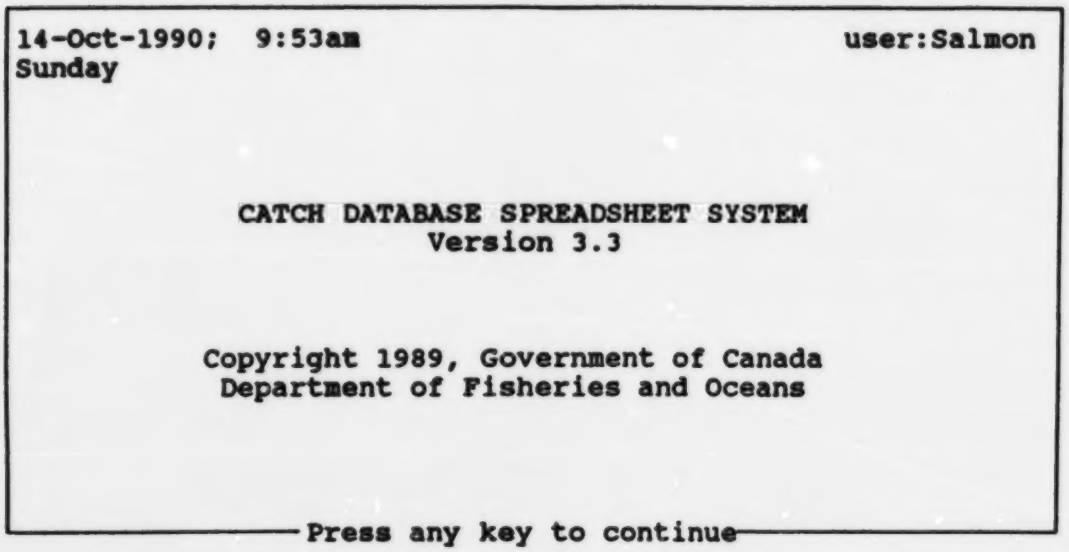

FIGURE 2. Catch Spreadsheet Identification Screen

The introductory screen provides information on copyright, date and time of report production (Figure 2).

The main menu

For the rest of the interactive session, the main display window contains the main menu at the top and a status line at the bottom (Figure 3). Each menu choice will be explained in detail.

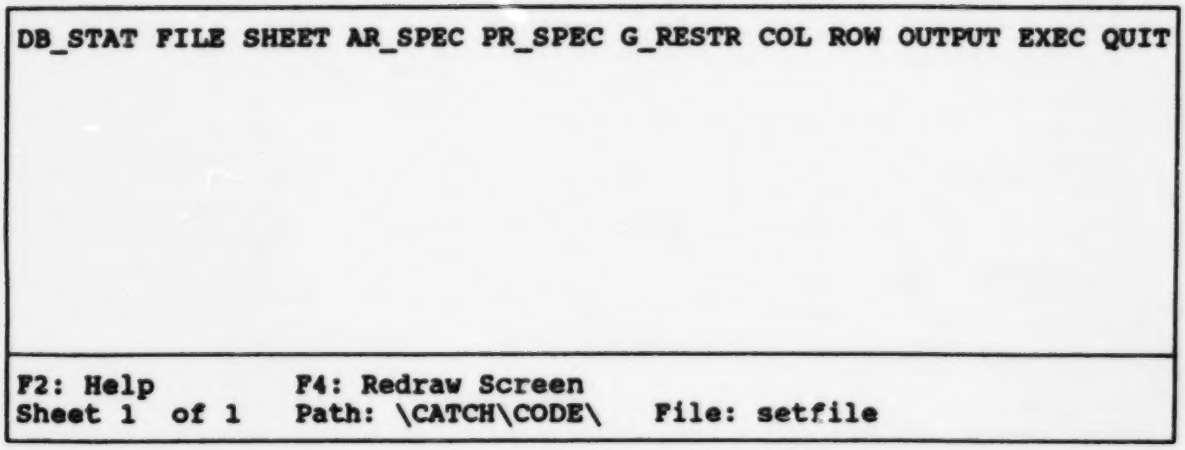
DB_STAT FILE SHEET AR_SPEC PR_SPEC G_RESTR COL ROW OUTPUT EXEC QUIT
F2: Help
F4: Redraw Screen
Sheet 1 of 1
Path: \CATCH\CODE\
File: setfile

FIGURE 3. The main menu.

Note: The order of menu items is not the order in which a report is created i.e. DB_STAT is the first item on the menu but it only gives information on the database, while G_RESTR is used to format the contents of the report.

The status line

The status line at the bottom of the main menu screen gives information on help keys, directory or path, filename and spreadsheet number. It provides information on help (**PF2**) and on refreshing the screen (**PF4**), as well as the name of the report (default file name is **setfile**), where the report is being created (**Path: [USERNAME]**) and which report is currently being worked on (**Sheet 1 of 1**). All of these items will be discussed in the following sections.

USER INTERFACE

This section describes the interactive program and how to produce a report. Read through this section briefly to get an idea of the choices to be made and then go to Appendix D to work through an example. This will produce a simple report so that the documentation that follows will be more meaningful.

Overview

A spreadsheet program creates a table of numbers arranged in rows and columns. The columns are the "vertical" lines of numbers, while the rows are the "horizontal" lines. Thus, in the table

1	2	3
4	5	6

the first row contains the three numbers 1, 2 and 3, while the third column contains the numbers 3 and 6. Such a table is often a useful way to organize complex data, especially when different rows and columns represent different facets of the data. For example, if, in the above table, we wanted to show the number of children enroled in grades 1-3 by the sex of the child, we could write

Numbers of children enroled in school

	Grade 1	Grade 2	Grade 3
Girls	1	2	3
Boys	4	5	6

Now our table is much more meaningful. In this trivial example, we have constructed a table containing numeric data which was organized in a logical way and becomes easy to interpret by the appropriate use of row and column labels.

The CDSS spreadsheet program allows the user to construct tables whose entries report on the commercial salmon catch in B.C. To organize a table in a meaningful way, the user must decide what information is wanted in the rows and columns of the table, and what labels are associated with rows and columns. Therefore, the first distinction we want to make is between the data reported in the table (the numbers themselves) and the column or row labels (a category of information). In the

example above, the data are the actual numbers of boys or girls in a specific grade. The categories are grade and sex. The position of a number in the table indicates that it belongs to the respective row and column categories. Thus, of the five students in grade 1, four are boys.

A more complex, but more relevant, table generated from the CDSS program is shown below:

		10		12	
		74	75	74	75
		Pieces	Pieces	Pieces	Pieces
Troll	STWK 061	0	126	991	941
	STWK 062	116	656	1738	1111
	STWK 063	703	375	10626	1672
	STWK 064	2627	1087	6791	2426
Gillnet	STWK 061	0	0	0	33
	STWK 062	0	0	95	297
	STWK 063	0	0	1000	2194
	STWK 064	0	0	5926	5564

This table reports the numbers of salmon (pieces) caught within each week for a four week period, over two years, in two statistical areas, by two types of fishing gear. Only one item in this list represents the data displayed in the table, the pieces. All other items in the list are category labels for either rows or columns.

Let us first examine the column labels. There are three levels of labels for the columns of the table. The upper level represents the statistical areas selected by the user for the report, areas 10 and 12. The next level represents the years selected by the user, 1974 and 1975. The final level of labelling is not a label at all, in the terms of CDSS, rather it is the name of the data type reported in the column, pieces. Notice that the middle level of labelling, years, is nested within the upper level, statistical areas. Therefore, since two areas have been selected, each year label is repeated twice, once for each area. All of the numbers in the first column satisfy both levels of label categories, that is, they represent numbers of salmon caught in area 10 in 1974. Likewise, all of the numbers in the last column represent numbers of salmon caught in area 12 in 1975.

The rows in this table have two levels of labels, gear and statistical week. Like the columns, the row labels are also nested. Thus, the first four rows report on separate statistical weeks for troll caught fish, while the next four rows do the same for gill net caught fish. The combination of row and column gives the individual entries in the table their unique meaning. For example, in area 10 in 1975 the troll fleet caught 1087 salmon during statistical week 064.

In addition to reporting the data selected by the user, the CDSS program can also provide row or column totals. This is often a useful feature. However, be warned that selection of totals can lead to a substantial increase in the size of the table produced. For example if we select the option to produce totals for both rows and columns for the above table, the resulting table is:

		10			12			TOTAL		
		74 Pieces	75 Pieces	TOTAL Pieces	74 Pieces	75 Pieces	TOTAL Pieces	74 Pieces	75 Pieces	TOTAL Pieces
Troll	STWK 061	0	126	126	991	941	1932	991	1067	2058
	STWK 062	116	656	772	1738	1111	2849	1854	1767	3621
	STWK 063	703	375	1078	10626	1672	12298	11329	2047	13376
	STWK 064	2627	1087	3714	6791	2426	9217	9418	3513	12931
	TOTAL	3446	2244	5690	20146	6150	26296	23592	8394	31986
Gillnet	STWK 061	0	0	0	0	33	33	0	33	33
	STWK 062	0	0	0	95	297	392	95	297	392
	STWK 063	0	0	0	1000	2194	3194	1000	2194	3194
	STWK 064	0	0	0	5926	5564	11490	5926	5564	11490
	TOTAL	0	0	0	7021	8088	15109	7021	8088	15109
TOTAL	STWK 061	0	126	126	991	974	1965	991	1100	2091
	STWK 062	116	656	772	1833	1408	3241	1949	2064	4013
	STWK 063	703	375	1078	11626	3866	15492	12329	4241	16570
	STWK 064	2627	1087	3714	12717	7990	20707	15344	9077	24421
	TOTAL	3446	2244	5690	27167	14238	41405	30613	16482	47095

The table has increased from 4 columns to 9 and from 8 rows to 15. Totals are shown for both levels of row and column labels. For example, 2849 fish were caught by troll in area 12 during statistical week 062 for the years 74 and 75 combined, while 3241 fish were caught for the same week and same area when troll and gill net gear categories are combined.

The final feature of the CDSS program to discuss in this overview is the concept of restriction. The tables for salmon data shown above were created by restricting the range of the row and column categories. For example, the years were restricted to just 1974 and 1975. If no restrictions are made for a label category, all the information for that label will be included. Thus, no restrictions on years would result in summing the data selected over the entire range of years contained in the database. Therefore, the process of restricting the label categories to select the information relevant to the user, is the key to using the program to create meaningful tables.

As an example of the combination of restriction and label selection, consider the table below.

	Pieces
STWK 061	2091
STWK 062	4013
STWK 063	16570
STWK 064	24421

To produce this table, the same restrictions on year, period, area, gear and species were selected as for the two previous tables. What was not selected was two levels of row and column label categories. Therefore, instead of reporting areas separately, they have been pooled. The same is true for years and gear types. Comparison of this table with the previous one shows that the pieces reported here match that portion of the previous table for which totals have been made over areas, years and gear types.

Note that by not segregating areas, years and gear types, the table is not well documented. Just by looking at this table, there is no way to tell that the catch from only areas 10 and 12, years 1974 and 1975 and gear types troll and gill net are being shown. To help with this problem, CDSS also prints a summary of the selections made by the user for every report generated. The summary for the above table is:

```
Sheet  1 of  1     Created 14-Mar-1991 11:26am
Title:
Area spec: STATS AREA-SUBS Period spec: STATS_PERIOD
Selected years:          74  75
Selected areas: 10       12
Selected periods:   STWK 061  STWK 062  STWK 063  STWK 064
Selected gear:        Troll      Gillnet
No species restriction
Selected data:              Pieces
Weight unit   Kg
Weight not corrected for % dressed
Cols: 1:none    N  2:none    N    Rows: 1:PERIOD  N  2:none    N  3:none    N
Output:  PRINTED
```

The combination of the table and the summary provide sufficient information to properly interpret the output from CDSS.

Working with the menu

The user makes choices through horizontal and vertical menus. The general procedures for moving through these menus is described before discussing the formation of the spreadsheet.

An entry can be chosen by typing the first letter of the entry (i.e. File or Screen) or by using the arrow keys to move to the item of choice and then hitting <Enter> (or <Return>). Where menu items begin with the same letter, the cursor goes to the first occurrence of that letter.

The main menu is displayed in one line across the screen top. Sub-menus are arranged one item above the other in boxes near the top left corner of the screen.

Here are some quick tips for working with text within the menus.

[PF2] - is the help key.
[PF4] - refreshes the screen if it becomes corrupted.
<\> - backslash key steps user back out of submenus.

Note: the arrows move along a line but not down unless you press the down arrow.

-> <-	: move within string.
<Ctrl-B>	: move to beginning of string
<Ctrl-E>	: move to end of string
<Ctrl-G>	: delete character to right of the cursor
<Ctrl-H> or <Delete>	: delete character to the left of the cursor
<Ctrl-D>	: delete to end of line
<Ctrl-I>	: toggle insert/overstrike mode
<Ctrl-Y>	: (abort) will work at a logical point in the program i.e. between sheets while <Ctrl-C> will return to the VAX prompt immediately.

Note: \ is used to step back out of the sub-menu. However <Return> or <Enter> are used when a choice has been selected. If these are not used, the program cannot handle the unexpected response and it will abort.

The CDSS menu

First, let us take a look at the types of operations the user performs by using the CDSS menu. The following three menu items determine the contents and layout of a spreadsheet report:

G_RESTR - Global restrictions. This menu item lets the user choose the appropriate subset of information in which he is interested. The data fields that can be restricted are all four stratum fields (year, area, period and gear), and the species field. For example, the user might be interested only in the years 1964 and 1982. He would then select only these years using the restriction procedures described below.

COL Column definition. There are two types of choices for definition of the column entries. The first is the type of data to be shown in the columns of the report. The data items are all from the catch fields of the database. The second choice is referred to as "sort level" and determines the label categories for the data. For example in the overview, the data selection was pieces, while the label categories were years and areas. Label categories all come from the stratum and species fields.

ROW Row definition. The row definition is similar to the column definition, with the exception that no data selection is involved. Therefore different rows of the table correspond to different label categories. In the overview example, the row label categories were gear and period. Row labels also come from either the stratum or species fields of the database.

The next two menu items let the user specify the units of measurement defining the area and time period.

AR_SPEC Area specification. The user chooses from the various types of areas the program supports. For example he may choose statistical areas or catch regions.

PR_SPEC Period specification. The user chooses either statistical weeks or statistical months as the time period units.

The last menu items select I/O options, report on the current status of the database, execute the program commands or return to the operating system.

DB_STAT Database status. Reports on the current status of information in the database.

FILE File specification. Lets the user name, save, retrieve and view CDSS files.

SHEET Spreadsheet name. Allows more than one spreadsheet to be constructed during a single session of program use.

OUTPUT Program output. Lets the user decide what type of output he wants.

EXEC Execute. Instructs the program to execute the commands built up by the user to produce the spreadsheet.

QUIT Quit the program. Returns control back to the operating system.

We shall now go through each of these menu items in detail and describe all of the relevant features.

The DB_STAT menu item

For the entire database the status is:

1) the latest year of data available,
2) the number of years of preliminary data,
3) the years for which days-open data are available (99 = not available),
4) descriptive text on data.

The FILE menu item

This submenu provides information on the files in the current directory and allows the retrieval or storage of spreadsheet specifications (files with the extension of .SET).

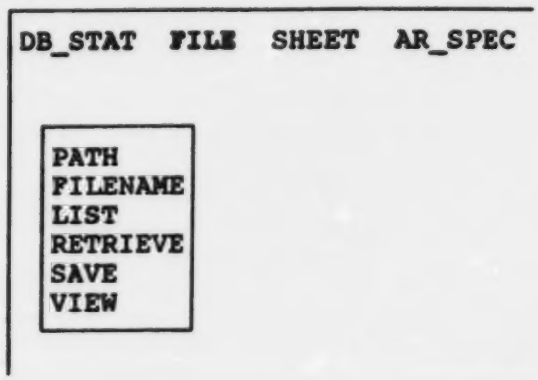

FIGURE 4. The FILE menu.

PATH - this allows a path or directory to be changed from the default directory in which the user is working to other directories.

FILENAME - the default file name is SETFILE and extension choices are described in Appendix E. A unique filename can be chosen here.

LIST - allows listing of files in the current directory defined by **PATH**. Save sets, the files in which spreadsheet specifications are stored have extension '.set'. If **LIST** is selected, all of the filenames from the current directory are listed. Selecting **USER_FILES** results in a prompt for the desired filename extension i.e. to list all of your .com files, erase the * and enter com.

RETRIEVE - choosing this will show a menu of all file names with the extension **.SET** from the current directory; a file can be selected from the list by moving over to it via arrows and hitting **<RETURN>**.

SAVE - when saving a file, the user is prompted for a filename. If a name has already been entered under **FILENAME** then moving to **SAVE** will save it under that filename.

VIEW - displays the same list of **.SET** filenames as does RETRIEVE. Lets the user see the files but not retrieve them.

The SHEET menu item

The SHEET sub-menu provides control over the sheets in a set. During an interactive session, more than one spreadsheet can be specified with **NEW**. A single spreadsheet specification is called a sheet, and the collection of sheets from one session is a set.

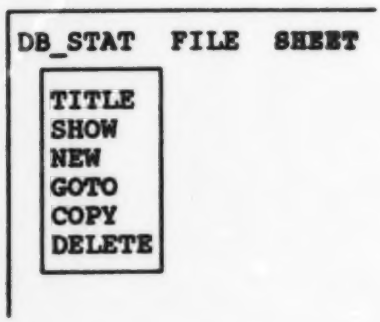

FIGURE 5. The SHEET menu.

TITLE - prompts for character string to form title of current sheet. Up to 50 characters can be chosen.

SHOW - displays information on the current sheet.

NEW - adds a new, empty sheet to the set. Note sheet number in the bottom left hand corner of the status screen. The maximum number of sheets is 10.

GOTO - prompts for the number of a sheet which then becomes the current sheet. This facilitates moving around a report with many sheets.

COPY - prompts for the sheet number where contents are to be copied to the current sheet. i.e. If the user has made the first sheet (report) then creates a new spreadsheet with **NEW**, *COPY allows information already entered for one sheet to be copied to another sheet.* This is very useful when many aspects of each sheet will contain similar information.

DELETE - removes a sheet from the set.

The AR_SPEC menu item

The data are stored in the database in terms of statareas, including subareas. The other area definitions represent combinations of statareas. The different area definitions are summarized below.

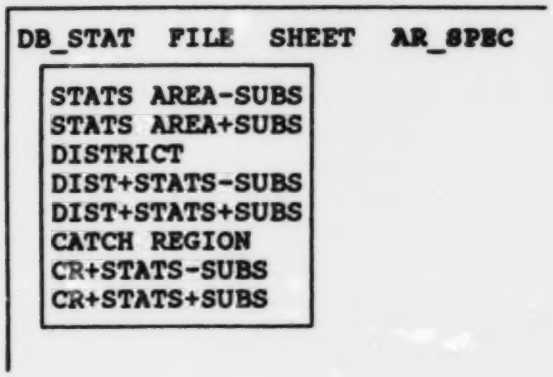

FIGURE 6. The AREA menu.

STATS AREA-SUB (the default):

1	2E	2W	3	4	5	6	7
8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23
24	25	26	27	28	29	30	C
Alaska	Taku	Stikine	Unknown	BC			

STATS AREA+SUBS

1	2AE	2BE	2AW	2BW	3X	3Y	3Z
4	5/6	5/1	5/2	5/3	5/4	6	7
8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23
24	25	26	27	28	29AB	29C	29D
29E	30	C	Alaska	Taku	Stikine	Unknown	BC

CATCH REGIONS (those geographical areas combing with gear). Please see **APPENDIX B** for catch region summary:

DISTRICTS

District 1 includes statareas 28, 29AB, 29C, 29D, 29E.
District 2 includes areas 1 - 10, 30 and Alaska.
District 3 includes 11 - 27, C.
District 4 includes Nass and Stikine Rivers.

The PR_SPEC menu item

The period specification menu allows a choice of reporting data by statistical week (statweek) or by statistical month.

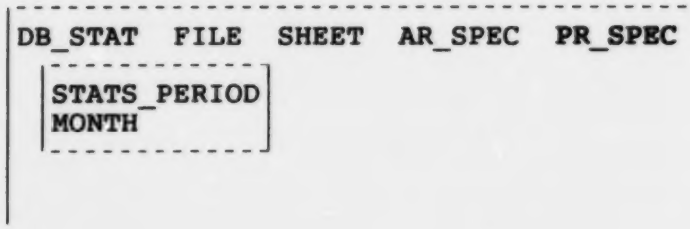

FIGURE 7. Time Periods.

The default for time period is statweek because commercial data are reported this way. Statweek defines the week as starting on Sunday and ending on Saturday except in 1981 when it began on Monday. Months are defined as being four weeks long except for April, July and October which have five weeks. Please see Appendix A for more information.

NOTE: The program will sum all the data if no restrictions are made i.e. to get an annual rollup, choose year but make no period choices.

The G_RESTR menu item

In Figure 8, the global restriction menu is shown and gear has been chosen to be defined from the sub-menu . The global restrictions menu defines the contents of a spreadsheet report. Salmon catch by year, period, area, gear and species along with units of weight and weight corrections may each be limited to the user selected values.

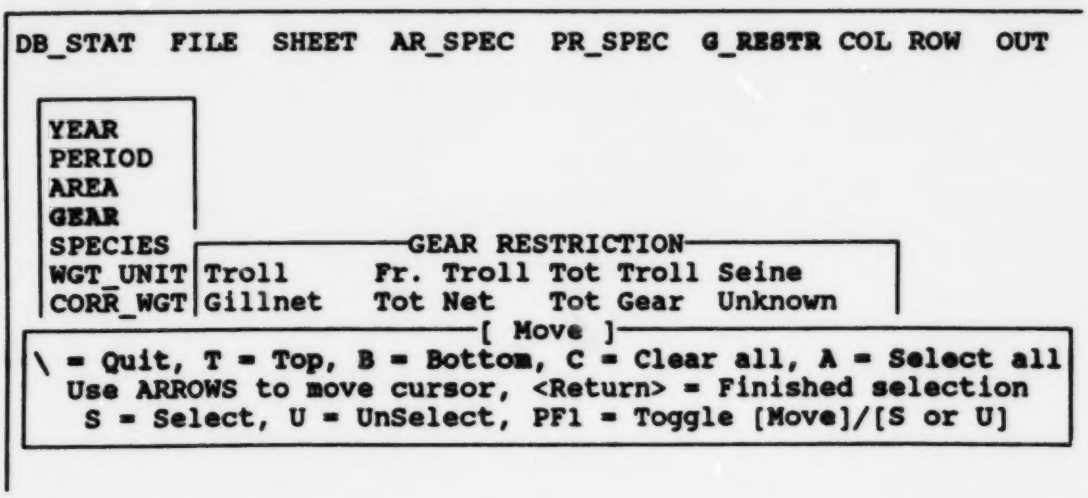
DB_STAT FILE SHEET AR_SPEC PR_SPEC G_RESTR COL ROW OUT
YEAR
PERIOD
AREA
GEAR
SPECIES
WGT_UNIT
CORR_WGT
GEAR RESTRICTION
Troll Fr. Troll Tot Troll Seine
Gillnet Tot Net Tot Gear Unknown
[Move]
\ = Quit, T = Top, B = Bottom, C = Clear all, A = Select all
Use ARROWS to move cursor, <Return> = Finished selection
S = Select, U = UnSelect, PF1 = Toggle [Move]/[S or U]

FIGURE 8. The global restriction menu.

The following section explains the small editor available within the menu selection box.

Menu selection editing - This box contains information for manipulating the data choices.

\ = Quit	- makes no choices.
T = Top	- to goto the top of the screen.
B = Bottom	- move to bottom of screen.
C = Clear all	- clears all previous chosen selections.
A = Select all	- to choose all data choices.
S = Select	- Hit S to begin selection.

U = UnSelect - Hit U to unselect data.
PF1 = Toggle [S or U] - can use this to move among data selecting and unselecting i.e. choosing chinook and coho in SPECIES.
<Return> = Finished selection - selects data chosen with S.
Use ARROWS to move cursor to data.

NOTE: Quit is the backslash (\) and no restrictions would be chosen. If a restriction is made then <RETURN> should be used.

G_RESTR menu : The individual menu items are described below.

Year - Data from 1952 available.
Period - choose the week (s) or month(s) which will define the report .
Area - choices can be either catch region, statareas, subareas or districts.
Gear - the gear choices are troll or freezer troll, seine and gillnet.
Species - Chinook includes the totals of the other chinook grades.
Wgt_unit- Kilograms (default) or pounds.
Corr_wgt- For troll the standard weight is dressed head on. This option will convert troll to round weight which is handy for comparing the total tonnage between troll and net. Default is weight not converted to round weight for troll (N).

There is a connection between gear and area when area is chosen as **CATCH REGION**. Catch region by its definition describes a geographical area and gear. Catch regions are used by MRP for sampling purposes. If catch region Northern Net (NN) were chosen as the area and troll as the gear, a spreadsheet with no data would be produced as NN is by definition an area for net gears.

The COL menu item

COL or column defines the vertical aspect of the spreadsheet. *Column divides its information between dependent and independent variables. Dependent variables are data and independent variables are sort levels.* Data (dependent) variables are : pieces, total weight, percent dressed weight, average weight, pieces per day fished, weight per day fished, number of boats, days fished, average price and landed value as you can see from Figure 9. Some of the dependent quantities listed, i.e. average weights, are calculated.

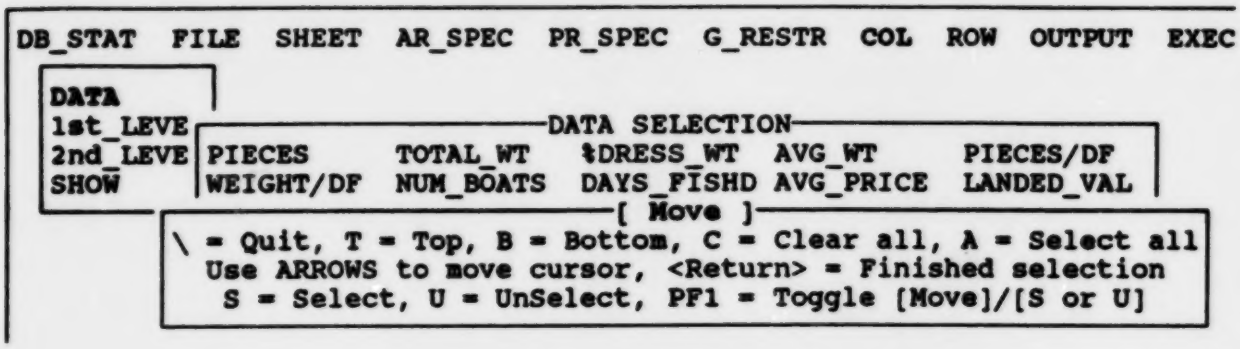
DB_STAT FILE SHEET AR_SPEC PR_SPEC G_RESTR COL ROW OUTPUT EXEC
DATA
1st_LEVE
2nd_LEVE
SHOW
DATA SELECTION
PIECES TOTAL_WT %DRESS_WT AVG_WT PIECES/DF
WEIGHT/DF NUM_BOATS DAYS_FISHD AVG_PRICE LANDED_VAL
[Move]
\ = Quit, T = Top, B = Bottom, C = Clear all, A = Select all
Use ARROWS to move cursor, <Return> = Finished selection
S = Select, U = UnSelect, PF1 = Toggle [Move]/[S or U]

FIGURE 9. Column/Data selection.

In the example above, **COL/DATA** has been selected and the **DATA** selection box shows choices available for report selection. DATA defines the numbers shown in the column(s) of the spreadsheet as:

PIECES -	the actual number of fish caught.
TOTAL_WT -	weight undressed, head on.
%DRESSED_WT -	% of fish out of the total landed that were dressed.
AVG-WT -	weight/pieces.
PIECES/DF -	days fished/pieces.
WEIGHT/DF -	weight/days fished.
NUM_BOATS -	# of CFV landings by area by statweek.
DAYS_FISHD-	Days fished for troll, landings for net.
AVG_PRICE -	Average price by weight.
LANDED_VAL -	Total landed value

• Weights for troll are dressed with head on, and for net are round weight. Collection of average weights information from the MRP commercial sampling program, enables the estimation of species and gear specific average weights. The MRP data is provided in a file by area, gear, period, and species and each record contains the number of fish sampled and average weight per fish. This information is supplied by the MRP data entry contractor, to Catch Statistics in Vancouver because these values are more accurate than those found in the average weight table generally used for editing purposes.

Independent variables (sort levels) are: year, period, area, gear and species. Column contents depend on the data items. Sort levels are used in columns to help specify categories of data of interest to the user. For example, the user may select pieces as the data item, and year as a sort level. This choice would result in one column per year for the years specified using G_RESTR. Each column would have the pieces caught in the corresponding year. If no sort levels are chosen i.e. from **1ST_LEVEL or 2ND_LEVEL**, the spreadsheet columns will become the data variables. Each sort level chosen after data variables are chosen, multiplies the number of values taken by that independent variable.

The ROW menu item

Spreadsheet rows are determined by one, two or three nested sort levels. A spreadsheet without at least one row sort level has no meaning, and this will generate an error message when the report is run. The number of rows in a spreadsheet are the product of the number of values taken by each sort level variable (plus one if summation [TOG_TOTAL] is specified).

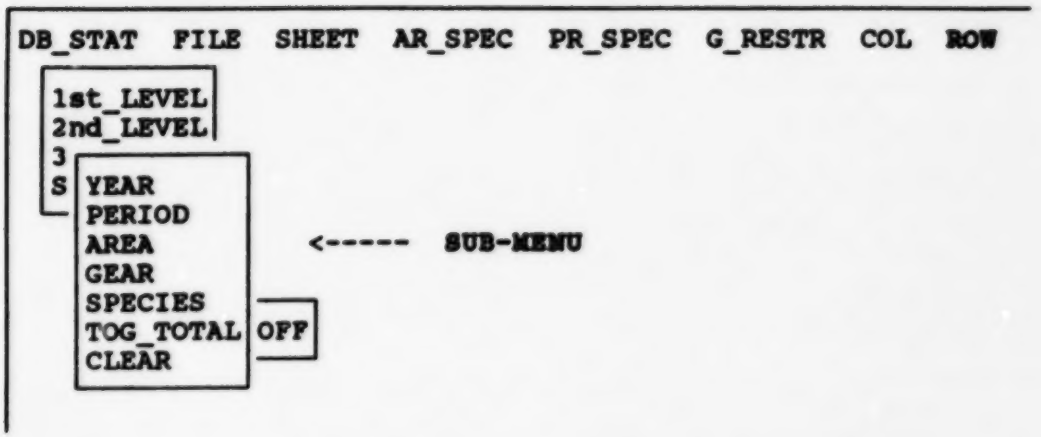

FIGURE 10. The ROW menu.

In the example below, **1ST_LEVEL** chosen was area, while **2ND_LEVEL** chosen was species. *Note that the row sorts from the finest detail of data (area) to the least detail (species) which is the reverse of most spreadsheet layouts.* **TOG_TOTAL will add the totals of a particular level in another row but was not chosen in this example.** **CLEAR** removes previous choices and leaves the level unchosen.

The column choices were **PIECES** for data and the 1ST_LEVEL was **YEAR.**

Sheet 1		84 Pieces	85 Pieces	86 Pieces	87 Pieces
Chinook	NTR	179665	186723	152999	177457
	SWTR	327853	279769	261103	265787
	NN	50767	70667	42716	41245
	SWVN	48313	21263	4115	612
Chum	NTR	61559	146935	50750	62135
	SWTR	1349	44929	52510	3127
	NN	857189	1019126	626966	371389
	SWVN	187117	1616890	387679	395446

FIGURE 11. Example of column/data & nested row levels.

The OUTPUT menu item

The output from CDSS is available in several forms. Interactive output of the spreadsheet will appear as a table of rows and columns on the computer screen. A larger spreadsheet can be viewed by scrolling. The cursor control arrow keys will cause movement by one row or column in the direction of the arrow. The keys <u>, <d>, <l> and <r> will cause the spreadsheet to move by one screen in the up, down, left and right directions respectively.

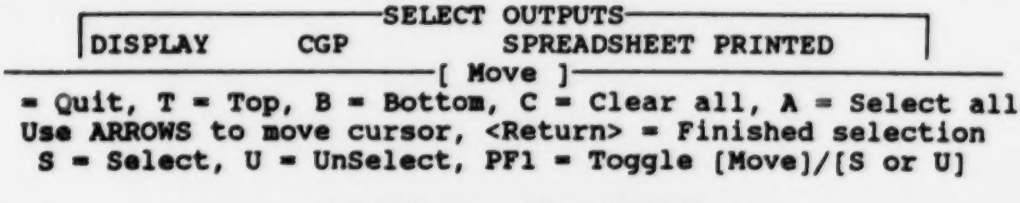
SELECT OUTPUTS
DISPLAY
CGP
SPREADSHEET
PRINTED
[Move]
= Quit, T = Top, B = Bottom, C = Clear all, A = Select all
Use ARROWS to move cursor, <Return> = Finished selection
S = Select, U = UnSelect, PF1 = Toggle [Move]/[S or U]

FIGURE 12. The OUTPUT menu.

DISPLAY - the spreadsheet will appear on the screen where it may be scrolled for viewing.

PRINTED - This choice is the default output method. The spreadsheet will be written to a file for subsequent printing on a 132 column printer. Spreadsheets too large for one printed page will be split over as many pages as necessary.

CGP - creates a data set that can be imported into the Custom Graphics Package by B. Kuhn (Can. Tech. Report No. 1659). The program contains a stand-alone program, specifically designed to interface the the MRP*Reporter program.

SPREADSHEET - will generate files which are formatted for input to a standard spreadsheet.

The EXEC menu item

The execute menu offers a choice of interactive or batch processing. *The default is interactive which processes the*

spreadsheet as you wait. Jobs can also be sent to the batch queue on the VAX which will free up your terminal to do other work.

GO - submits job to batch queue on the VAX or to interactive screen depending on which choice has been made in **DEVICE**.

DEVICE - defines how the job will be run. Short (CPU time of 3 minutes or less) batch queue (**SQB**), long batch queue (more than 3 minustes CPU time to run), the interactive screen (will run immediately from the screen at the **GO** command) or **CREATE_JOB_FILE** which creates a batch file (.COM extension) to be submitted to any queue at another time. Several different file extensions are created depending on what output files are chosen and also on how the job is run. See Appendix E for details.

BE_USER - for use by SSA group only.

Consistency Checks and Limitations: When the **GO** sub-menu item is selected under **EXECUTE**, then a set of consistency checks is done on the spreadsheet specifications which the user has established. This is done sheet by sheet, and the user is prompted for instructions to continue after each sheet has been checked. If a problem is found i.e. no **DATA** selection was made or the same sort level was made in both **COL** and **ROW**, a warning or error condition is generated. When all sheets in the set have been checked, the program checks for warning or error conditions and will display a prompt on whether or not to proceed with processing. Usually the user would choose not to proceed until the problem has been corrected.

Users who discover combinations of specifications which result in erroneous spreadsheets but for which the program issued no warning or error messages should report them to the system maintenance person so the program can be modified appropriately.

The QUIT menu item

To exit the spreadsheet select **QUIT** and reply 'yes'.

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Kuhn, Brian R., D.W.A. Whitfield and Tony Chumak. 1988. The Custom Graphics Package: a Pascal programmer's graphics toolbox and data presentation system. Canadian Technical Report of Fisheries and Aquatic Sciences No. 1659.

Whitehead, Valerie. 1990. Commercial Catch Statistics System, Workflow, Procedures, and Data. Dept. of Fisheries & Oceans in-house document.

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APPENDIX A

Statweeks are labelled by a three digit code. The first two digits delineate the month and the last one specifies the week within the month. Each statweek in the catch database has 7 days and each month has 4 statweeks except that months 04, 07 and 10 each have 5 periods. Statweek 120 in CDSS is defined as all periods from December through February, inclusive.

The table below for 1975 gives the week ending day and the statweek (MMW). A table for any year can be generated by running:

$run ssa:[CWTSYS.TABLES]MMWTAB

Running this program will produce statweeks for all periods from January but CDSS uses dates from March 1st through Nov. 30th.

ENDING DAY	MON	YR	STATWEEK
08	03	75	031
15	03	75	032
22	03	75	033
29	03	75	034
05	04	75	041
12	04	75	042
19	04	75	043
26	04	75	044
03	05	75	045
10	05	75	051
17	05	75	052
24	05	75	053
31	05	75	054
07	06	75	061
14	06	75	062
21	06	75	063
28	06	75	064
05	07	75	071
12	07	75	072
19	07	75	073
26	07	75	074
02	08	75	075

09	08	75	081
16	08	75	082
23	08	75	083
30	08	75	084
06	09	75	091
13	09	75	092
20	09	75	093
27	09	75	094
04	10	75	101
11	10	75	102
18	10	75	103
25	10	75	104
01	11	75	105
08	11	75	111
15	11	75	112
22	11	75	113
29	11	75	114
DEC,JAN,FEB		75	120

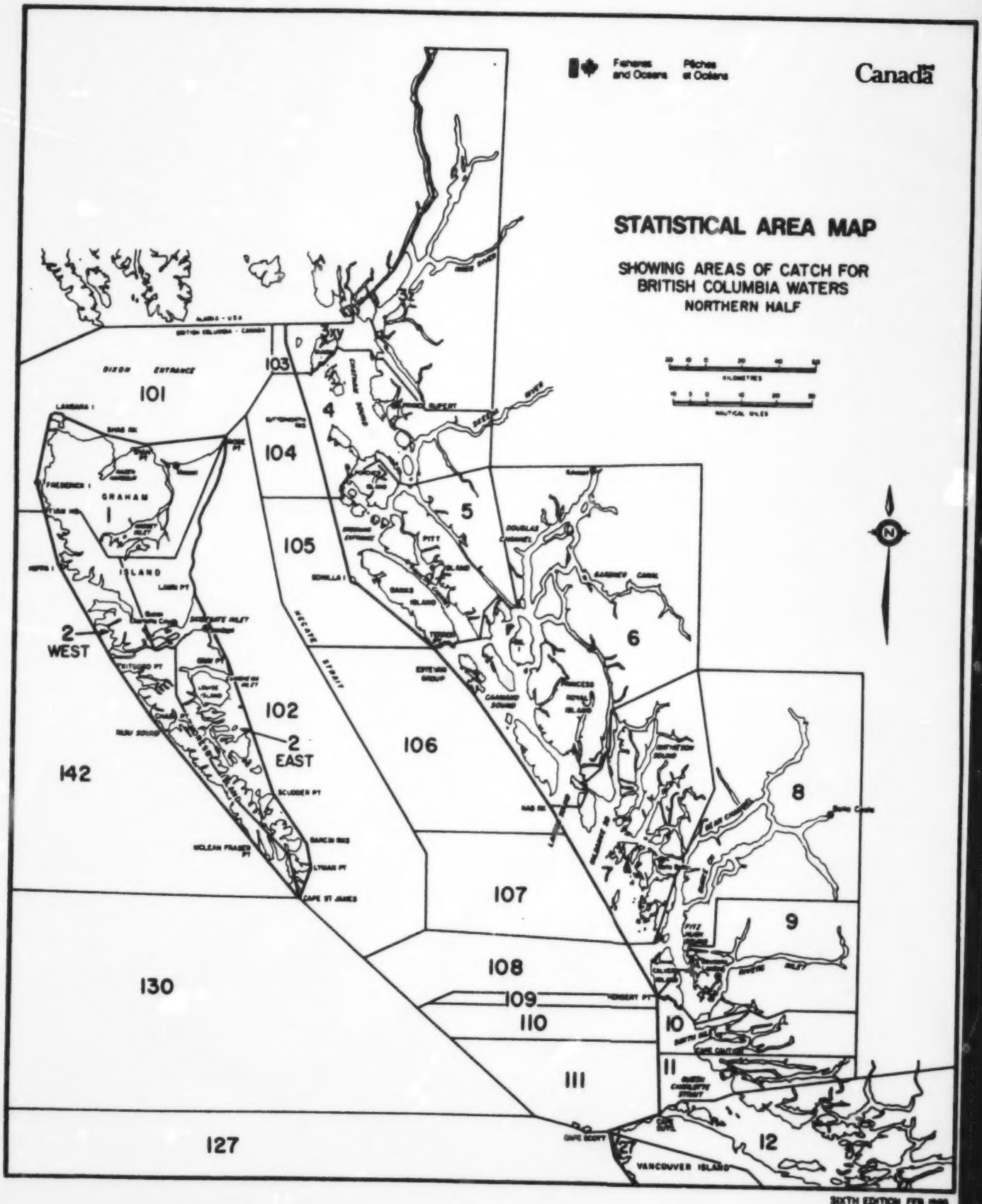

FIGURE 13. Northern British Columbia Statarea Map

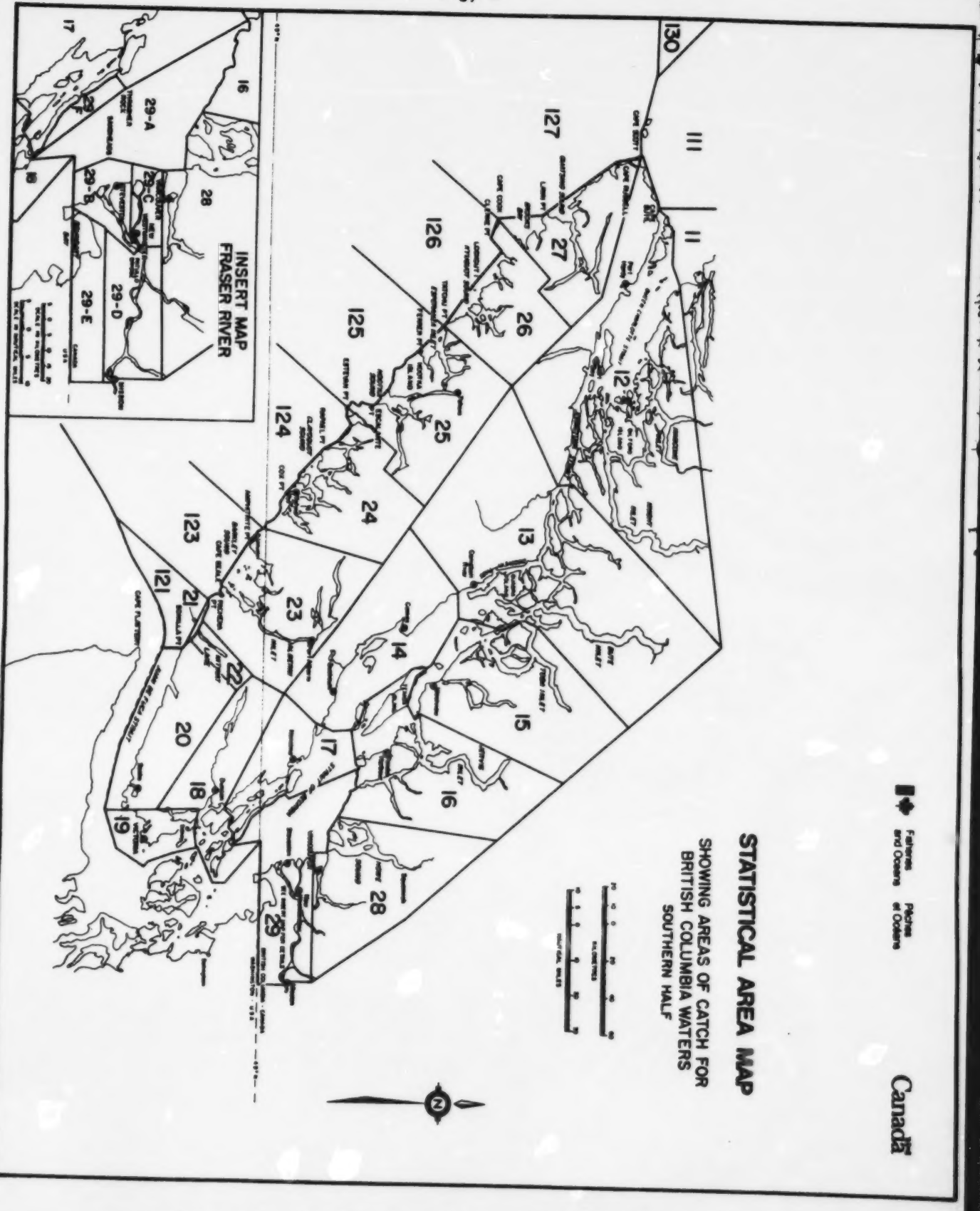

FIGURE 14. Southern British Columbia Statarea Map

The statistical area maps for British Columbia shown on the preceding pages shows how the areas are divided for various fisheries by DFO. Statistical areas are combined to form larger areas that define catch by a gear. The list below shows four aspects of data for catch region/statarea divisions. The first row is the catch region number i.e. catch region 04 is Georgia Strait Troll. The second column lists the abbreviation of the catch region that is used in the spreadsheet program when you are defining area by catch region. The third column gives a description of the catch region while the fourth column tells you which of the statareas belong to that catch region.

For some years some statistical areas were divided into subareas (i.e. statareas 2, 5) and data is reported by subarea when available. Care should be used when using subareas since they will not necessarily total to statarea. Historical data (catch region WOT & AKN data were collected prior to 1979, when Canadian fishermen were permitted to fish off the American coast).

#	CATCH REGION	DESCRIPTION	STAT AREAS
01	NWTR	NW Van. Is. Troll	(STATS 25 - 27)
02	SWTR	SW Van. Is. Troll	(STATS 21,23,24)
03	WOT	Wash/Oreg Troll	Historical
04	GSTR	Georgia Strait Troll	(STATS 13 - 18,29A,B,C)
06	NTR	Northern Troll	(STATS 1 - 5)
07	ATR	Alaska Troll	Historical
08	FGN	Fraser River Gill Net	(STATS 29A,B,C,D,E)
09	NN	Northern Net	(STATS 1 - 5)
10	GSN	Georgia Strait Net	(STATS 14 - 18)
11	JSN	Johnstone Strait Net	(STATS 12, 13)
12	CN	Central Net	(STATS 6 - 11)
13	JFN	Juan De Fuca Net	(STATAREA 20)
14	JFTR	Juan De Fuca Troll	(STATAREA 20)
20	NWVN	Northwest Van. Is. Net	(STATS 25 - 27)
21	SWVN	Southwest Van. Is. Net	(STATS 21 - 24)
56	NCTR	North Central Troll	(STATS 6 - 9, 30)
57	SCTR	South Central Troll	(STATS 10 - 12)
58	FSN	Fraser Seine	Opening at the mouth

APPENDIX C

MICRO-COMPUTER SYSTEM REQUIREMENTS

The Catch Data Summary (or Spreadsheet) System (CDSS) will run on any IBM PC or AT compatible with 640 KiloBytes (Kb) of memory and a hard disk large enough to accommodate the data files. Program files (software to run the spreadsheet) require 1/2 MegaBytes (Mb) of disk space; the index and data files require approximately 350,000 bytes per year. The years 1952 to 1989 total approximately 11Mb of disk space. Programs and data files for micro-computers are available from the Salmon Information Group. Yearly updates for current data files will be required as the data goes from a preliminary status to a permanent status (no more editing is done). Any preliminary data years will require yearly updated files to be obtained from the Salmon Group.

Obtain program and data files from the SSA group. A copy of the spreadsheet programs and the catch data and index files for all available years must be loaded into the microcomputer.

To run the program on the micro, go to the directory where program files are kept i.e. c:\catch\code and enter **CDSS**:

```
C:\CATCH\CODE\CDSS
```

Generally, the procedures for running the catch spreadsheet program on the VAX will work also for the micro-computer. Some of the differences are as follows:

The program limits the total number of columns, and the integrity checking mechanism enforces that limit. On the micro, the user is allowed 50 columns and 106 rows.

The user may interrupt program execution by using the <Ctrl-C> and <Ctrl-Y> keys. For the former to be effective, the MS-DOS command **BREAK ON** should be issued before starting the program. Then <Ctrl-C> will return the user to the DOS command level and <Ctrl-Y> will result in a choice to quit or continue execution.

NOTE: Unlike the VAX, micro-computers will not accumulate more that one version of a filename. It is good policy to assign unique filenames for each of the spreadsheet reports created. On the micro, each subsequent report created without changing and saving filename as a unique name will write the current report into that same filename i.e. SETFILE..*

On the micro, processing is limited to interactive jobs, which also produce a printable report. However, the user can create batch files for use to import to the VAX.

GO - submits job to run on the interactive screen or creates a batch file to run later. It initiates data processing and integrity checking followed by calculation of the appropriate data.

DEVICE - a batch file is created to run after exiting the interactive program.

These are the file extensions created when the job is submitted to batch:

.SET - setup parameters to re-create saved reports.
.FIL - created when batch file is chosen.
.BAT - command file to be submitted to batch (micro).

APPENDIX D

The report below can be replicated by following the directions. The directions will follow the procedures used on the VAX.

Sheet 1		1987 CHINOOK DATA FOR AREAS 1 - 5 Pieces	Total Wgt	% Dressed	Avg Weight
Troll	1	57989	478141	100.0	8.2
	2E	7942	54575	100.0	6.9
	2W	38168	329823	100.0	8.6
	3	3847	26950	100.0	7.0
	4	2768	16179	100.0	5.8
	5	3366	22134	100.0	6.6
Seine	1	7528	49285	62.1	6.5
	2E	5	20	26.7	4.1
	2W	1400	5808	100.0	4.1
	3	18153	73686	32.4	.1
	4	2148	11894	42.1	5.5
	5	976	5098	19.3	5.2
Gillnet	1	428	4464	99.5	10.4
	2E	8	43	18.1	5.3
	2W	0	0		
	3	1370	6337	57.2	4.6
	4	9055	59129	66.3	6.5
	5	174	738	46.0	4.2

FIGURE 15. Report Example.

1. SSA C
2. The introductory screen comes up and hit <Enter>.
3. The AR_SPEC is set at STATS AREA-SUBS (default).
4. The PR_SPEC is set at STATS_PERIOD (default).
5. Goto G_RESTR menu and hit <Enter>. Cursor goes to Year. Hit <Enter>. Year sub-menu comes up. Choose 1987 using the arrow keys. On 1987, hit S (Select). Hit <Enter>.
6. Choose Areas by hitting A or by using the arrow keys down to Area. Hit S. Use arrows over to 5. Note highlighted selection which indicate the choices. If you go over too far i.e. to 6, hit U and this will unselect 6.

Hit <Return> (if you hit /, then no choices will be made). If you want to check your choices are okay, hit <Return> again and the highlighted areas should be there. If not select them again and make sure to hit <Return>. Hit <Return> to get back to sub-menu.

7. Go to Gear. Hit <Return>. Hit S to select **TROLL** and then hit the down arrow to select **GILLNET**. Hit PF1 (F1) and then arrow over to **SEINE** and hit S. Hit <Return>. Checking selections can be done as in 6.
8. Go to Species. Hit <Return> and then select **CHINOOK**. Hit <Return>.
9. Return to main menu line and choose **COL**. Select **DATA** and choose **Pieces, Total Wgt, % Dressed** and **Avg Weight** by using the arrow keys and following the directions in the help box. When **DATA** is complete hit <Enter> and then return to main menu </>.
10. In **ROW** , choose **1ST_LEVEL** as **AREA** and **2ND_LEVEL** as **GEAR**.
11. Return to main menu and choose Output. Printed is the default. This report will be running interactively so we will choose **Display** also to see the report on the screen. Hit S.
12. If you aren't sure what you have, you can check it out by going back to the main menu (using <\>) and choosing **SHEET**. Hit S (in this case it means **SHOW**). Figure 16 is what you should see. The title was added by being in **SHEET** and choosing **TITLE** . You can enter up to 50 characters to make a title.

```
                              SET DESCRIPTION
Sheet  1 of  1     Created 27-Aug-1990  8:28am
Title: 1987 CHINOOK DATA FOR AREAS 1 - 5
Area spec: STATS AREA-SUBS Period spec: STATS_PERIOD
Selected years:          87
Selected areas: 1        2E       2W       3        4        5
No period restriction
Selected gear:         Troll       Seine       Gillnet
Selected species     Chinook
Selected data:               Pieces  Total Wgt  % Dressed Avg Weight
Weight unit   Kg
Weight not corrected for % dressed
Cols: 1:YEAR     N  2:none     N     Rows: 1:AREA     N  2:GEAR     N  3:none
Output:  DISPLAY       PRINTED
```

FIGURE 16. Sample of SHOW for Report Example.

13. Before running the program, save the file into a unique filename. Go back to the main menu and choose **FILE**. Choose **FILENAME** and delete setfile with the backspace key. Enter a unique name. Go to **SAVE** and hit <Enter> (Save will have your unique name already installed. <Enter> saves it under that name.
14. Back to the main menu and choose EXEC. To use the DISPLAY feature of the OUTPUT menu, INTERACTIVE is the choice (as well as being the default). Choose GO.

APPENDIX E

The following extensions are used on filenames generated by the system under the default **setfile** unless the user saves the report as a unique filename. Multiple report extensions of the same filename, with the exception of .SET, will be saved on the VAX. The spreadsheet program keeps only one copy of yourfile.SET.

On the VAX when all output options are chosen and a **create job file** option is chosen, the following extensions are saved:

.SET - setup parameters to re-create saved reports
.COM - batch file setup to be submitted by the user for the VAX

When batch jobs are chosen the program submits the report to the chosen queue and these file extensions are created:

.SET - setup parameters to re-create saved reports
.LOG - when batch jobs are submitted to queue, logs detail problems etc.
.C01 - custom graphics file
.S01 - spreadsheet file for importing to other programs
.PRT - puts data into simple report format for printing

When interactive mode is chosen data will appear on your screen as well as in these file extensions:

.SET - setup parameters to re-create saved reports
.C01 - custom graphics file
.S01 - spreadsheet file for importing to other programs
.PRT - puts data into simple report format for printing